

Serial No.: 09/079,471
Group Art Unit: 3761

REMARKS

Claims 1-24 are in the case.

Applicant gratefully acknowledges the Examiner's allowance of Claims 15-20.

Applicant gratefully acknowledges the Examiner's allowance of Claims 4, 6, 9, and 11 if rewritten as independent claims including the limitations of any intervening claim.

Claims 1; 3, and 4-9 have been amended to delete reference to "support member" and to recite "bearing plate."

Claim 1 has been amended to more particularly point out and distinctly claim that which Applicant regards as his invention to recite an apparatus for providing a primary roof control support in an underground mine, including a round or oval dome-shaped bearing plate for contacting, supporting, and compressing a roof in an underground mine; a center aperture in the bearing plate for receiving the roof bolt when installed in the mine roof; apertures on the bearing plate for hanging cables and wires and "J" hooks; recessed center on the bearing plate to aid in concealing the head of the roof bolt when installed in the mine roof and causing a lock washer effect on the roof bolt; and a center recessed area on the bearing plate adapted to cause the outside rim to contact the roof first and then compress the roof at a 30 to 45 degree angle.

Serial No.: 09/079,471
Group Art Unit: 3761

Claim 2 has been amended to recite wherein the bearing plate is adapted to replace a base plate operating in conjunction with a safety plate.

Claim 3 has been amended to recite wherein the round or oval shaped dome is adapted to cause outer rim contact first.

Claim 10 has been amended to recite a method for providing a primary roof support system in an underground mine including the steps of positioning a roof bolting machine in an area to be secured or bolted in an underground mine; drilling a hole into a mine roof through an immediate roof into an upper strata to a specified depth deeper than the length of the roof bolt being used; inserting a plastic tube of epoxy resin and hardener into the drilled hole; inserting a roof bolt through a aperture of the roof bolt plate; centering the bolt head in a drill machines rotation head; applying upward pressure and rotation as the bolt is pushed into the drilled hole in the roof, breaking the tube of epoxy resin and mixing the resin and hardener together and forcing the mixture into any cracks or separations in the strata; and subsequently after the plate and bolt head reach within about an inch of the roof, stopping the upward pressure and remaining spinning, stopping the spinning motion, and applying the full upward pressure of the bolting machine to push the roof bolt and center of the plate to compress the immediate roof, subsequently

Serial No.: 09/079,471

Group Art Unit: 3761

lowering the bolter head after a second or two and observing the quality of installation by noticing the lock washer effect on the head of the bolt, and optionally observing whether the bolt head lowers with bolting machine, such that the installed bolt has lost its anchorage, then installing another bolt to replace the failed one, if necessary, and moving the next area in the underground mine to be secured.

Claim 11 has been amended to recite wherein the roof bolt plate features a round or oval dome shaped plate and the specified depth is in a range of approximately three to four inches.

Claim 12 has been amended to delete "elliptical" and recite "oval." Claim 12 also has been amended to delete reference to "extreme" and recite "heavier or broken."

New Claims

New Claims 21-24 are added to present Claims 4, 6, 9, and 11, respectively, as independent claims including the limitations of any intervening claim.

New Claim 21 has been added to recite original Claim 4 and all intervening claims as independent. Claim 21 now recites an apparatus for providing roof support in an underground mine, including a round, dome-shaped bearing plate having an extended lateral surface for contacting an inside roof of an underground

Serial No.: 09/079,471
Group Art Unit: 3761

mine; a center aperture in the bearing plate for accommodating a roof bolt such that the roof bolt can be passed through the bearing plate to secure the bearing plate to the roof of the underground mine; wherein the roof bolt passing through the bearing plate is interposed between the roof bolt and the inside roof of the underground mine; wherein the bearing plate is recessed and the extended lateral surface comprises a circular configuration in the general form of a plate; and wherein the bearing plate features a center deflection with respect to the radial edge of the bearing plate such that the bearing plate is convex with respect to the mine roof surface. Support for the Amendment is found in original Claims 1-4.

New Claim 22 has been added to recite original Claim 6 and all intervening claims as independent. Claim 22 now recites an apparatus for providing roof support in an underground mine, including a round, dome-shaped bearing plate having an extended lateral surface for contacting an inside roof of an underground mine; a center aperture in the bearing plate for accommodating a roof bolt such that the roof bolt can be passed through the bearing plate to secure the bearing plate to the roof of the underground mine; wherein the roof bolt passing through the bearing plate is adapted such that the bearing plate is interposed between the roof bolt and the inside roof of the under-

Serial No.: 09/079,471
Group Art Unit: 3761

ground mine; wherein the bearing plate is elliptical with a circular configuration in the form of a plate; wherein the bearing plate features a center deflection with respect to the radial edge of the bearing plate such that the bearing plate is convex with respect to the mine roof surface. Support for the Amendment is found in original Claims 1, 2, 5, and 6.

New Claim 23 has been added to recite present Claim 9 and all intervening claims as independent. Claim 23 now recites in combination with a roof bolt and associated bearing plate used for primary roof support in an underground mine, the improvement including a round dome-shaped bearing plate having an extended lateral surface for contacting an inside roof of an underground mine, and further defining an aperture therethrough such that the roof bolt can be passed through the aperture of the bearing plate to secure the bearing plate to the inside roof of the underground mine, with the bearing plate interposed between the bolt head and the inside roof of the underground mine, wherein the bearing plate has a substantially circular or elliptical configuration, and the bearing plate features a center deflection with respect to the radial edge of the bearing plate such that the bearing plate is convex with respect to the mine roof surface. Support for the Amendment is found in original Claims 7-9.

Serial No.: 09/079,471
Group Art Unit: 3761

New Claim 24 has been added to recite original Claim 11 and all intervening claims as independent. Claim 24 now recites a method for providing primary and supplementary roof support in a underground mine, including the steps of drilling a hole through a roof of the underground mine and into upper level rock strata; inserting a container of adhesive material into the hole; inserting a roof bolt through the bearing plate and into the hole, the insertion of the roof bolt fracturing the container of adhesive material, thus allowing the adhesive material to be distributed around the roof bolt, securing the roof bolt in the hole and securing the bearing plate to the roof of the underground mine for providing primary and supplementary roof support; and the bearing plate features a center deflection with respect to the radial edge of the bearing plate such that the bearing plate is convex with respect to the mine roof surface. Support for the Amendment is found in original Claims 10-11.

Drawings

The drawings stand objected to under 37 C.F.R. 1.83 (a). The Examiner has noted that the drawings must show every feature of the invention specified in the Claims and has taken exception to the "base plate" of Claims 2, 7, 10, and 15, and the "lock washer" of Claim 15 as not shown or the features cancelled from

Serial No.: 09/079,471
Group Art Unit: 3761

the Claims. No new matter may be entered, and corrected drawing sheets are required in reply to the Office Action to avoid abandonment of the application.

Claims 2, 7, 10, and 15 have been amended to delete reference to base plate and lock washer.

The drawing requirements for the base plate and lock washer are believed to have been overcome by the Claims which have been amended to delete reference to base plate and lock washer, and the requirements in accordance with the Examiner's requirements to show every feature of the invention specified in the Claims are respectfully requested to be withdrawn.

The term "Base Plate" used in claims 2, 7, and 10 has been deleted. Applicant's bearing plate does not require a "base plate." There would be no drawing showing the use of a "Base Plate." This wording and drawing are shown on Robertson's patent 1 (e). The term "Lock Washer" used in claim 15, is meant to be "Lock Washer Effect." By lock washer effect is meant the spring action effect of the recessed center when the head of the bolt and plate are pushed to the roof. The spring effect or lock washer effect holds outward tension on the head of the roof bolt and the center of the plate and acts as a "lock washer," thereby keeping the bolt and plate tight. There is no "Lock Washer" to be shown on the drawings.

Serial No.: 09/079,471
Group Art Unit: 3761

New formal drawings are attached and accompany this Amendment. No new matter has been added.

For the foregoing reasons, the objection to the drawings is believed to have been overcome and is respectfully requested to be withdrawn.

ABSTRACT

The abstract of the disclosure is objected to because the Examiner takes the position that it refers to purported [sic] of the invention, compares the invention with the prior art, and contains language which can be implied. Correction is required.

The formal Abstract has been amended to be under 150 words in length and to contain proper language.

For the foregoing reasons, the objection to the abstract of because it refers to purported of the invention, compares the invention with the prior art, and contains language which can be implied.

35 U.S.C. 112

Claims 12-14 stand rejected under 35 U.S.C. 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as his invention.

Serial No.: 09/079,471
Group Art Unit: 3761

Claim 12 has been amended to delete the word "extreme."

The wording of "extreme roof conditions" has been changed to read "heavier or broken roof conditions." The claim limitation as amended means the roof has given signs that more weight could be hanging on the roof support system than normal, and the need for a stronger plate with strengthening ribs would be desired.

For the foregoing reasons, the rejection of Claims 12-14 under 35 U.S.C. 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as his invention is believed to have been overcome by the amendments to the Claims and is respectfully requested to be withdrawn.

35 U.S.C. 102(e)

Claims 1-3, 7, 8, and 10 stand rejected under 35 U.S.C. 102(e) as anticipated by Robertson, Jr. et al. U.S. Patent No. 6,682,268 (hereinafter "Robertson").

The Robertson patent teaches a secondary supplementary roof support that must be used in conjunction with a primary roof support system. Applicant's novel bearing plate is intended to be the primary roof control system and, as such, requires no additional plates or washers. The prior art type of additional support is very costly when added to the price of the regular

Serial No.: 09/079,471
Group Art Unit: 3761

roof control system. Applicant's novel bearing plate is used in all types of roof conditions and is effective without any added cost. The prior art roof plate requires no testing and can be used only in addition to the approved system and cannot be used instead of the approved system.

Applicant's novel bearing plate must be tested and approved by the federal and state agencies and can be used without other types of additional support. Robertson's patent provides a convex plate having an umbrella turned inside out effect when used in very deep grooves in the roof. When the plate is pushed beyond the level plane, the outer edge will protrude downward away from the roof. Robertson's Fig. 2 section AA shows this. Applicant's novel bearing plate does not have the umbrella effect because the recessed center will pull the outside rim inward and always towards to roof.

Robertson's outer rim provides a groove facing downward away from the roof and has a sharp ledge creating a hazard for persons and equipment damage when working in the lower seam mines. Applicant's novel bearing plate, on the other hand, does not leave protruding edges of any kind to cause injury to workers. The outer rim of Applicant's invention as claimed pushes toward and into the roof to a certain degree. The thin outer rim of Applicant's novel bearing plate conforms to the roof and always

Serial No.: 09/079,471
Group Art Unit: 3761

bows toward the roof. The bolt head is lowered even more into the travelway of the mine and is even more vulnerable to damage by passing equipment because of the added distance of the plate, base plate, washer, and bolt head. The referenced distance between the mine roof and end of the bolt head is critical in the lower mining seams. Applicant's novel bearing plate hides the bolt head to a preferred degree and keeps it recessed into the plate as much as possible and tight to the roof, thereby to protect the roof control system from damage by equipment and prevent injury to workers who must rub against the plates and bolt heads. Robertson's plate will not eliminate the dangers associated with square and rectangle plates. These secondary supplementary plates must still be used in conjunction with the square plates. They will still leave sharp corners and edges protruding downward when pushed into uneven areas of the roof. Applicant's novel bearing plate is one piece round plate and does not leave sharp corners and edges to injure workmen.

The Robertson plate holds draw rock in place. Draw rock is a few inches of roof material that can break up and fall to the bottom of the mine floor. Many times, draw rock will not breakup and fall under normal conditions for many years of standing. One would have to anticipate this condition or use the extra plate continually while bolting.

Serial No.: 09/079,471
Group Art Unit: 3761

Applicant's novel bearing plate is used as a primary support and compacts the roof directly above and around the roof bolt head, thereby providing compression to create the beam-like effect that will keep the lower strata and upper strata joined together.

All roofs will show signs of stress after mining has been done. A major objective is to create a roof that will be sound and safe to travel and work under as the mined material is removed.

Robertson's plate, as shown on Fig. 3 of Robertson's patent, uses a plate which is very awkward and time consuming. When the bolt is in the roof, the operator has to hold the bolt in the roof, add the secondary plate, add the primary plate, add the washer, and then start the nut onto the threaded bolt. Robertson's type of bolting is not feasible in the mining industry. One of the most important aspects of a roof bolt plate is a preferred ability to be stored or stacked in confined spaces. The top of a bolting machine might, in some cases, clear the roof by only inches when loaded with the supplies needed for a shift. Using two different plates decreases the amount of supplies that the operator carries at one time, thereby requiring the need to restock the machine more often and cost more in the mining cycle and more time. Federal MSHA (Mine Safety and Health Administra-

Serial No.: 09/079,471
Group Art Unit: 3761

tion) and PA state inspectors have found Applicant's plate to be a preferred means and method to decrease violations and injuries because of loose roof plates and damaged roof control.

For the foregoing reasons, the rejection of Claims 1-3, 7, 8, and 10 under 35 U.S.C. 102(e) as anticipated by Robertson, Jr. et al. U.S. Patent No. 6,682,268 (hereinafter "Robertson") is believed to be based on an insufficient reference and is respectfully requested to be withdrawn.

35 U.S.C. 102(b)

Claims 12-14 stand rejected under 35 U.S.C. 102(b) as anticipated by Rubenacker U.S. Patent No. 6,282,857 (hereinafter "Rubenacker").

The Rubenacker plate is used in the construction field and could not be used in the mining industry as an underground roof support.

The Rubenacker plate is a fastener assembly designed to hold roofing panels in place in high winds. The Rubenacker plate has an oblong shape with straight edges on the extended ends.

Applicant's novel bearing plate, on the other hand, is a true oval or elliptical shape with the entire perimeter rounded and no straight edges.

Serial No.: 09/079,471
Group Art Unit: 3761

There are many sharp edges on the Rubenacker plate for equipment and persons to come in contact with.

Applicant's novel bearing plate has no sharp edges. Applicant's novel bearing plate actually directs equipment and other objects over the plate by gliding over the radius of the plate and not having edges to catch on.

Rubenacker's plate could not be used in lower mining seams because it gives no consideration to limited space. Plates used in mining need to be snug to the roof.

Applicant's novel bearing plate considers the limited space in the lower mining seams. Applicant's novel bearing plate will fit snug to the roof and even conform to the uneven areas.

The aperture of the Rubenacker plate is an oblong shape. The Rubenacker type of aperture tears the material around the bolt head under a heavy sagging roof.

Applicant's bearing plate uses a round aperture so as to have equal distance around the bolt when installed in the plate.

The Rubenacker plate is made of molded plastics.

Mining roof bolt plates are made of steel. Thin plastics would not hold the weight of a crumbling roof in a mine.

The Rubenacker device has a flat solid bottom surface. The Rubenacker type of surface on a mine roof would cause the plate to bend and break because of the uneven roof conditions.

Serial No.: 09/079,471
Group Art Unit: 3761

Applicant's novel bearing plate is designed to have the outer edge thin so the rim can conform to the uneven roof conditions. The dome shape will cause Applicant's plate to flatten out against the roof and pressurize the surrounding roof.

The Rubenacker plate is not a dome shape, but is more of a step flange. If the Rubenacker type of plate were to be used in the roof of an underground mine, the equipment and persons would be catching on its outer edges. Passing equipment would damage the Rubenacker type of plate and in turn would cause the roof support to be ineffective.

Applicant's novel bearing plate deflects passing equipment rubbing the roof control system by having the rounded areas. All square edges have been eliminated.

The Rubenacker design of plate could not be used in an underground mine. In the lower seam mines, one of the most important aspects of a roof bolt bearing plate is the ability to stack and store the plates in a confined space. The Rubenacker plate cannot be stacked; so storage and transportation would be very difficult.

Applicant's novel bearing plate can be stacked inside each other as a stack of dishes, so minimal space is required and transporting is easy.

Serial No.: 09/079,471
Group Art Unit: 3761

The Rubenacker plate is made to be used with 1A to 1/2 wood or metal screws not 4 to 20 foot, 1 inch steel bolts with a 1 5/16 bolt head.

The recessed center of Rubenacker's plate is to hide the head of the screw and act as a stop for the screw.

The recessed center of Applicant's invention forces the outer rim tight to the surface, and then the center continues to move to the roof compressing the strata. The spring action of the center bearing force to the roof is designed to act as a lock washer holding the bolt and plate tight to the roof and concealing some of the bolt head. The center of Applicant's novel bearing plate is of importance to the installer, to determine the quality of installation as the bolts are installed. Applicant's bearing plate is a one piece saucer shaped plate.

For the foregoing reasons, the rejection of Claims 12-14 under 35 U.S.C. 102 (b) as anticipated by Rubenacker U.S. Patent No. 6,282,857 (hereinafter "Rubenacker") is believed to be based on an insufficient reference and is respectfully requested to be withdrawn.

Applicant's invention as claimed, as amended, provides in one aspect an apparatus for providing a primary, approved, roof control support system in an underground mine, incorporating in combination a round or oval shaped dome-shaped bearing plate for

Serial No.: 09/079,471

Group Art Unit: 3761

contacting, supporting, and compressing a roof in an underground mine; a center aperture in the bearing plate for receiving the roof bolt when installed in the mine roof; apertures on the bearing plate for hanging cables and wires and "J" hooks; recessed center on the bearing plate to aid in concealing the head of the roof bolt when installed in the mine roof and causing a lock washer effect on the roof bolt; and a center recessed area on the bearing plate adapted to cause the outside rim to contact the roof first and then compress the roof at a 30 to 45 degree angle, which is nowhere shown, taught, or even suggested in the prior art cited as the basis for rejection.

Applicant's invention as claimed, as amended, provides in one aspect a method for positioning a roof bolting machine in an area to be secured or bolted in an underground mine; drilling a hole into a mine roof through an immediate roof into an upper strata to a specified depth deeper than the length of the roof bolt being used; inserting a plastic tube of epoxy resin and hardener into the drilled hole; inserting a roof bolt through a aperture of the roof bolt plate; centering the bolt head in a drill machines rotation head; applying upward pressure and rotation as the bolt is pushed into the drilled hole in the roof, breaking the tube of epoxy resin and mixing the resin and hardener together and forcing the mixture into any cracks or separa-

Serial No.: 09/079,471

Group Art Unit: 3761

tions in the strata; and subsequently after the plate and bolt head reach within about an inch of the roof, stopping the upward pressure and remaining spinning, stopping the spinning motion and applying the full upward pressure of the bolting machine to push the roof bolt and center of the plate to compress the immediate roof, subsequently lowering the a second or two the bolter head and observing the quality of installation by noticing the lock washer effect on the head of the bolt, and optionally observing whether the bolt head lowers with bolting machine, such that the installed bolt has lost its anchorage, then installing another bolt to replace the failed one, if necessary, and moving to the next area in the underground mine to be secured, which procedure can take less than one minute from start to finish, providing an approved, primary roof support system in an underground mine, which is nowhere shown, taught, or even suggested in the prior art cited as the basis for rejection.

The prior art made of record has been reviewed and is not believed to be the basis for any prior art rejection.

Formal allowance of Claims 15-20 further to the Examiner's indication of allowance in the last Office Action, is earnestly solicited.

Formal allowance of Claims 4, 6, 9, and 11 further to the Examiner's indication of allowance, if rewritten as independent

Serial No.: 09/079,471
Group Art Unit: 3761

claims as presented in new Claims 21-24 including the limitations of any intervening claim, in the last Office Action, is earnestly solicited.

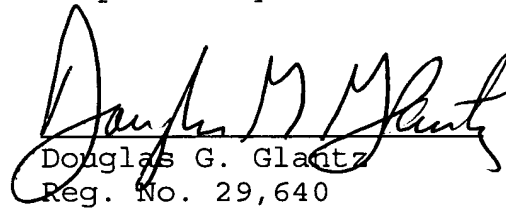
Formal acceptance of the accompanying formal drawings is earnestly solicited.

Reconsideration of this application is requested.

Respectfully submitted,

October 25, 2004

Douglas G. Glantz
Attorney At Law
5260 Deborah Court
Doylestown, PA 18901-1949
Voice: (215) 794-9775
Fax: (215) 794-8860
DGG/mnr


Douglas G. Glantz
Reg. No. 29,640